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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/642,774	08/18/2003	Adrian Maxim	55123P238	3673

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EXAMINER


VAN ROY, TOD THOMAS

ART UNIT	PAPER NUMBER
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2828

DATE MAILED: 01/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/642,774	<b>Applicant(s)</b> MAXIM ET AL.	
	<b>Examiner</b>  Tod T. Van Roy	<b>Art Unit</b> 2828	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 November 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2,4-26 and 28 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 22-26 and 28 is/are allowed.
- 6) ☒ Claim(s) 1,2,4-9 and 13-18 is/are rejected.
- 7) ☒ Claim(s) 10-12,19-21 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 November 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Amendment***

The examiner acknowledges the amending of claims 1-2, 4, 11, 13, 20, 22, and 28, as well as the cancellation of claims 3 and 27.

### ***Drawings***

The drawings were received on 11/21/2005. These drawings are accepted.

### ***Response to Arguments***

Applicant's arguments with respect to claims 3, and 13 have been considered but are moot in view of the new ground(s) of rejection.

### ***Double Patenting***

Applicant is advised that should claim 1 be found allowable, claim 13 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-2, 6-9, 13, and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tan (US 6859473) in view of Schuelke et al. (US 6879608).

With respect to claims 1 and 13, Tan teaches a laser driver comprising: a cascoded output switch (fig.3 #310,300) having a pair of output devices (fig.3 #310) and a pair of cascode devices (fig.3 #310); a resistor providing tail current to the output devices (fig.3 rectangular element below #300, same symbol used to represent resistor #260); a predriver circuit (fig.2 #60) receiving an input signal (fig.2 #100) and controlling the output devices (fig.2 #130); a feedback circuit coupled the resistor to control the modulation current of the output devices by control of bias on the predriver circuit (fig.3 #194 thru fig.2 #130, col.4 lines 19-35, monitor diode current fed back to create offset which is used to change the modulation current), and using a cascode bias circuit (fig.3)

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coupled to bias the cascode devices to a bias voltage responsive to the power supply voltage (fig.3 #200), output bias current (fig.3 I<sub>bias</sub>), and the modulation current (fig.3 I<sub>mod</sub>). Tan does not teach a common mode feedback circuit providing modulation dependent currents for the predriver. Schuelke teaches a laser driver utilizing a common mode feedback circuit providing modulation dependent currents for the predriver (fig.3 loop starting at #62 thru op-amp #59 to predriver side near #12,14; col.3 lines 27-30 (common mode voltage), col.4 lines 15-19 (speaking of the modulation current)). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the laser driver of Tan with the feedback of Schuelke in order to provide an increased laser driver compliance voltage over all operating conditions and eliminate need for AC coupling to the diode (Schuelke, col.4 lines 20-25).

With respect to claim 2, Tan and Schuelke teach the laser driver as outlined in the rejection to claim 1 above, and further teach the on-chip summation of the modulation current and output bias current (Tan, fig.2 bias #186 and mod #184 summed at #190 and output to driver at #192) at a low impedance node of the active cascode device (Tan, fig.3 #184 and #186 enter active cascode at low impedance node).

With respect to claim 6, Tan and Schuelke teach the laser driver as outlined in the rejection to claim 1 above, and further teach the modulation current to be externally adjustable (Tan, fig.2 #120, set value adjustable externally).

With respect to claims 7 and 9, Tan and Schuelke teach the laser driver as outlined in the rejection to claim 1 above, and further teach the driver to be an integrated circuit (Tan, col.4 lines 39-40) and the predriver bias control (Tan, fig.2 #110,

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set value adjustable externally) and the modulation current are independently externally adjustable (Tan, fig.2 #120, set value adjustable externally).

With respect to claim 8, Tan and Schuelke teach the laser driver as outlined in the rejection to claim 1 above, and further teach driver to be an integrated circuit (Tan, col.4 lines 39-40) and the predriver bias control (Tan, fig.2 #110, set value adjustable externally) and the modulation current are externally adjustable (Tan, fig.2 #120, set value adjustable externally). Tan and Schuelke do not teach the change to be made by a single adjustment. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the bias and modulation currents into one signal as it is well known in the art to combine two related control signals into one in order to reduce time needed to make changes to the controlled device.

With respect to claims 16, and 18, Tan, and Schuelke teach the laser driver as outlined in the rejection to claim 13 above, and further teach the driver to be an integrated circuit (Tan, col.4 lines 39-40) and the predriver bias control (Tan, fig.2 #110, set value adjustable externally) and the modulation current are independently externally adjustable (Tan, fig.2 #120, set value adjustable externally).

With respect to claim 17, Tan, and Schuelke teach the laser driver as outlined in the rejection to claim 13 above, and further teach driver to be an integrated circuit (Tan, col.4 lines 39-40) and the predriver bias control (Tan, fig.2 #110, set value adjustable externally) and the modulation current are externally adjustable (Tan, fig.2 #120, set value adjustable externally). Tan, Schuelke, and Royer do not teach the change to be made by a single adjustment. It would have been obvious to one of ordinary skill in the

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art at the time of the invention to combine the bias and modulation currents into one signal as it is well known in the art to combine two related control signals into one in order to reduce time needed to make changes to the controlled device.

Claims 4-5 and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tan in view of Schuelke and further in view of Royer et al. (US 5043992).

With respect to claim 4, Tan and Schuelke teach the laser driver as outlined in the rejection to claim 1 above, but do not teach the driver to use a PTAT bandgap reference circuit using positive temperature coefficients for the predriver gain stages. Royer teaches a laser driver utilizing a PTAT bandgap reference (abs. lines 1-7) using positive temperature coefficients (col.3 lines 44-55) for the predriver gain stages (fig.2 bandgap reference #20 located before the other predriver elements #25, and hence any gain stages (additional transistors)). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the laser driver of Tan and Schuelke with the PTAT bandgap reference of Royer in order to appropriately change the current based on threshold changes due to temperature shifts.

With respect to claim 5, Tan, Schuelke, and Royer teach the laser driver as outlined in the rejection to claim 4 above, and further teach the modulation current to be externally adjustable (Tan, fig.2 #120, set value adjustable externally).

With respect to claim 14, Tan, and Schuelke teach the laser driver as outlined in the rejection to claim 13 above, and Royer further teaches the laser driver to comprise a laser driver utilizing a PTAT bandgap reference (Royer, abs. lines 1-7) using positive



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temperature coefficients (Royer, col.3 lines 44-55) for the predriver gain stages (Royer, fig.2 bandgap reference #20 located before the other predriver elements #25, and hence any gain stages (additional transistors)).

With respect to claim 15, Tan, Schuelke, and Royer teach the laser driver as outlined in the rejection to claim 14 above, and further teach the driver to be an integrated circuit (Tan, col.4 lines 39-40) and the predriver bias control (Tan, fig.2 #110, set value adjustable externally) and the modulation current are independently externally adjustable (Tan, fig.2 #120, set value adjustable externally).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tod T. Van Roy whose telephone number is (571)272-8447. The examiner can normally be reached on M-F.

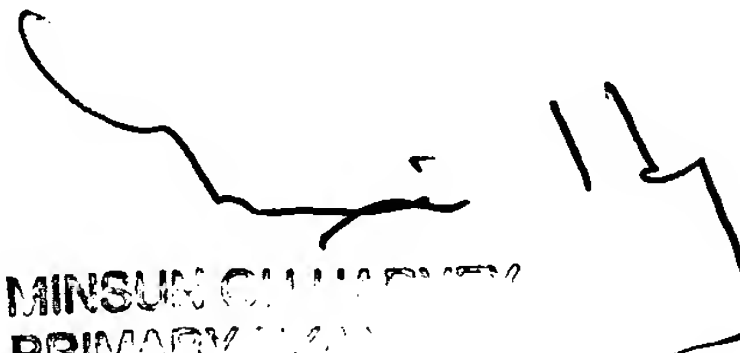
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on (571)272-1835. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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